BEFORE THE FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Inquiry Regarding Carrier Current Systems, Including Broadband over Power Line Systems	ET Docket No. 03-104
Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line Systems	ET Docket No. 04-37

COMMENTS OF ROBERT B. FAMIGLIO, ESQ.

Pursuant to the Federal Communications Commission's ("Commission") notice released February 23, 2004, Robert B. Famiglio, Esq., individually and not as a representative of any other party, herein comments on the *Notice of Proposed Rule Making, In the Matter of Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband Over Power Line Systems,* ET Dkt. No. 03-104, ET Dkt. No. 04-37 (adopted Feb. 12, 2004) ("Proposed Rule").

INTRODUCTION:

These comments are filed by the undersigned generally in support of the Commission's notice of proposed rule making regarding adoption of new requirements including enhanced measurements guidelines and remedial action to be applicable to access broadband over power line systems. However, the instant comments support even stricter guidelines and measurement requirements for any Broadband over Power

Line System ("BPL") because such enhanced requirements are in the public interest, would enhance national and Homeland Security, and would begin a more enlightened and useful policy change to address the underlying problem of cross user interference, spectrum overuse and spectrum pollution over the long term.

BACKGROUND OF COMMENTER:

The present comments are prepared by, and are the opinion solely of the undersigned based on personal experience with the subject matter and within the following context of such experience. I am an active radio amateur involved mainly with public service communications, as well as activities at the amateur level which are largely aimed at studying the radio arts and experimenting with new modes and equipment without a pecuniary purpose. Licensed since 1967, I hold an amateur extra class license (K3RF), as well as a Commission issued general radio telephone operator license (formally known as a first class radio telephone license). My formal education includes a B.S. in electrical engineering and a *juris doctorate* degree. I have been in the private practice of law for approximately twenty-five years. I am licensed to practice before the United States Patent and Trademark Office and have been involved with a variety of different patent applications for both internet technologies and communciations systems, in some instances including technology applicable to BPL.[1] I also serve as the net manager for the Radio Amateur Civil Emergency Services (RACES) and Amateur Radio Emergency Service (ARES) of Delaware County

[1] *These comments are not filed on behalf of any company or individual interested in the outcome of the present proceedings, nor does the undersigned presently represent any parties who could be effected by the outcome of these proceedings, with the exception of a few AM and FM broadcast stations which may be effected indirectly if at all. The instant comments are the opinions of this writer only.*

(suburban Philadelphia), Pennsylvania.

For almost twenty years I have been active as a volunteer legal counsel to provide *pro bono* advice to radio amateurs on legal issues which may affect amateur radio operation specifically and radio communications generally. Part 15 devices, particularly those which use or are otherwise coupled to power lines, have presented the most difficult operational and legal issues to radio amateurs and more generally to other unlicensed users of the HF frequency spectrum whom utilize receiving equipment for such users receiving broadcast, aviation and marine weather information, government time signals and propagation forecasts, and the like. The below comments result from my individual experiences with interference from both power line and part 15 devices, multiplyed by the additional experience I have gained providing *pro bono* counsel to other radio amateurs affected by such problems. My experience in that regard has included providing counsel on interference issues resulting from intentional, unintentional and incidental radiators, as such radiators are defined by the Commission's rules.

SUMMARY OF COMMENTS:

Strictly enforcing existing rules as well as enhancing the restrictions for BPL radiation limits, creating full and advanced notice reporting requirements and placing strict liability on BPL providers to eliminate virtually all interference including interference specifically to licensed mobile stations utilizing the effected spectrum is in accord with the stated objectives of the Commission to evaluate and strengthen

measures for protecting the nation's communications infrastructure, facilitating rapid restoration of the U.S. communications infrastructure and facilities after disruption by threat or attack, and to develop policies that promote access to effective communciations services by public safety, public health and other emergency and defense personnel in emergency situations. Further, adopting and enforcing strict requirements to prevent any interference by BPL providers will assure that suitable and more effective broadband technologies will be deployed faster to all Americans by preventing certain problematic BPL technologies from prevailing because they have shifted their costs onto other users of the radio spectrum. Finally, imposing stricter radiation measurement requirements and limits, as well as requiring detailed reporting requirements of the identity of both proposed and operational BPL facilities would be, (this commenter argues), a worthy goal of the Commission in developing a national strategic plan to begin to minimize the overwhelming amount of spectrum pollution which is causing a weakening of the country's entire wireless telecommunication structure now and in the years to come.

I. Any Regulations Applicable to BPL Should Require that the BPL provider, as a Minimum, Be Strictly Liable to Eliminate All Interference to Any Licensed Operating System, Fixed or Mobile, to Avoid Allowing the BPL System Operator to Realize Operating Economies by the Shifting of Their Cost onto Licensed and Other Unlicensed Spectrum Users.

BPL has been touted as the answer to provide inexpensive broadband service to

the consumer, most notably to those consumers in rural areas. At least one commissioner has stated that BPL is "broadband nirvana." The Commission's willingness to allow degradation of other forms of radio communications may be based on the false belief that BPL will be a low-cost alternative to other delivery systems of broadband service. Assuming, *arguendo* that BPL will provide competitive pricing structures for delivery of BPL to consumers, the lower price is only realized because the costs are shifted from the BPL service providers to the public by consumption of the HF spectrum that will occur in those areas affected by the now proven interference from such systems. If BPL systems leak interference over the HF spectrum, even if operating within part 15 rules, such systems in essence consume the affected spectrum because other present users of the same spectrum cannot use it when presented with low levels of interference. While BPL systems will not be permanently affected by low levels of interference the BPL system receives, other spectrum users, particular mobile users as discussed below, will bear the cost of the system and in essence subsidize the BPL provider.

The philosophy of BPL systems is to provide internet service over the existing network infrastructure of power wires. If it could do so with absolutely no interference, there would be little question that BPL would be "broadband nirvana," instead of "radio spectrum Armageddon." The Commission should pose the question as to why power companies are not using their extensive right of way and transmission poles to run other noise-free, more effective types of broadband to provide the "third wire" that the honorable chairman of the Commission would like to see available. Power companies

would likely report that running fiber optic cables or other types of interference-free transmissions systems would cost too much money to start up. While that may or may not be true overall, it is likely true when compared to the cost of using existing power lines for conveying broadband signals. The problem with the cost equation is that in presenting such arguments the promoters of BPL discount entirely costs they impose on the users of the spectrum, whether it is just the amateur radio operators, or all of the other spectrum users.

If the initial reports of substantial interference are correct, and even if the interference is by way of low level weak signals leaking from BPL, the present users of the spectrum would be foreclosed from using the frequencies they now use in the same way they use those frequencies presently. In arguing for BPL rule relaxation, BPL providers suggest that the interference that BPL causes are not "harmful," and therefore they do not violate part 15 of the rules. In making such arguments, BPL system operators do not understand (or do not desire to understand) how the present users of the spectrum operate, and the fact that any low level interference, even just above the noise level can seriously interfere with the expensive and state-of-the-art systems that many amateurs and other important users deploy.

It is this commenter's experience that many radio amateurs have considerable investments in their station, many times deployed for the public good, as discussed below. A typical dedicated amateur typically has $10,000.00 to $20,000.00 invested in his or her amateur station at any one time. My fixed station, not unlike many other fixed stations I have visited in my area over the years, has at any one time more than

$20,000.00 of equipment, largely invested in high quality receivers capable of discerning signals at or below the natural background noise level. Even small amounts of interference from part 15 devices which have been inflicted on my station have caused a considerable loss of value of the systems that I have designed.

Having been located in the same, typical residential area for the last eighteen years, I have noticed a substantial increase in noise, not just from power line interference as an unintentional radiator, but more so from the proliferation of part 15 devices in my neighborhood in the last eighteen years, particularly those devices which use the power line to communicate, such as home computer networking devices that use the AC power lines. In fact, such part 15 devices have been one of the greatest problems in reducing interference to both amateur operations and monitoring other frequencies for other services from my home station.

As discussed in more detail below, many radio amateurs invest considerable monies in both their amateur fixed station and amateur mobile operation. Degradation of the HF radio spectrum that will surely follow widely deployed BPL will likely discourage those amateurs from continuing pursuit of the radio arts and building and constructing state-of-the-art, high performance stations to both advance the radio state-of-the-art and to maintain a high level of training with communications skills. Surely something will be lost to the public if this occurs.

Moreover, interference to other unlicensed radio users in the affected HF spectrum will surely occur[2]. The public relies on the inexpensive and almost universally

[2] *Discussion of licensed HF users is deferred to below.*

deployed citizens' band radio transceiver in the 27 MHz spectrum as the public's failsafe neighborhood intercom system when there is a local, regional or national emergency, and cell phones and telephones are unavailable because power is out, lines are down and radio is the only usable form to gather information about what's happening. BPL noise created to mobile stations operating in this region will surely squelch any continued deployment or use of the public's most common radio band, CB, as discussed in more detail below.

Before deciding on final regulations, it is of consuming importance that this Commission analyze the real cost of deploying BPL if in fact any interference occurs. While the Commission believes that part 15 provides that BPL system operators must mitigate interference or cease operation, this is simply not likely in the real world. A quick study of the part 15 rules reveals that part 15 based operation must only cease if there is "harmful" interference to a licensed radio service. (The regulations do not adequately address interference to unlicensed users such as CB, shortwave receivers for government time signals and propagation reports, and AM and FM receivers).

In this lawyer's opinion, a rational argument for a BPL system provider to advance is that although interference is being reported, it is minimal in the BPL provider's opinion and therefore not "harmful." The problem with this approach is that even small levels of interference will reduce the value of the affected spectrum to the user receiving the noise. This cost must be quantified before the Commission proposes final rules, so that it may determine whether in fact absolute requirement that no interference occur are in the public interest. This commenter argues that it is and

requests the Commission to carefully consider all of the comments provided in this proceeding regarding all of the interference issues. Few proceedings before this Commission have the potential to create the massive problems reasonable, and well credentialed, experienced technical specialists acting in good faith are sure BPL will create.

II. New Regulations Should Provide Substantial Protection for Mobile and Portable Stations Even If Such Stations Are Transient Through the BPL Interference Area, as Such Stations are the Most Vulnerable and at the Same Time the Most Important Class of Users in the Context of National Security and Homeland Security, Particularly in View of This Commissions Stated Strategic Goals for Our Country.

The Commission has stated that its strategic goal for Homeland Security is to provide leadership in evaluating and strengthening the Nation's communications infrastructure, in ensuring rapid restoration of that infrastructure in the event of disruption, and in ensuring that essential public health and safety personnel have effective communications services available to them in emergency situations.[3] In that regard the Commission states:

> *To fully and effectively carry out its role in promoting homeland security, network protection, interoperability, redundancy, and reliability, the FCC has established the following objectives:*
>
> • *Evaluate and strengthen measures for protecting the Nation's*

[3] ***See**: http://www.fcc.gov/homeland/*

communications infrastructure.

• Facilitate rapid restoration of the U.S. communications infrastructure and facilities after disruption by a threat or attack.

• Develop policies that promote access to effective communications services by public safety, public health, and other emergency and defense personnel in emergency situations.

The Commission observes that there is significant disagreement among the commenting parties regarding the interference potential of Access BPL. A number of parties contend that Access BPL poses the potential for new interference to a variety of radio service.[4] If this is the case, and a cursory review of the comments filed to date assures that it is, it seems prudent to tread cautiously and avoid creating a situation from which retreat will cause considerable expense and inconvenience. The expense will have the most impact on the general public who may be enticed to try BPL service without knowledge of its serious drawbacks and likely outages as surely will be required during system shutdown necessitated due to interference caused by, or caused to, the effected BPL system.

The Commission is likely aware of the usefulness of the Amateur Radio Service as a dedicated group of volunteers, frequently first responders, who maintain a high level of demonstrated technical competence and practiced expertise in solving difficult communications problems on short notice in response to local, regional or national emergencies or other public service needs. Perhaps the Commission was paying only lip service to the Amateur community when it referred to the Service as America's only

[4] NPRM at ¶ 14, P. 7

fail safe communications system in time of emergency. If the stated goals of the Commission are important, then the balance of the risk verses harm of imposing regulations and requirements strictly limiting ***any*** interference by BPL to users of the spectrum clearly falls in favor of absolute limits on interference and required shutdown of interfering systems within a very short period of time.

In the light of advancing toward the Commission's goal of enhancing Homeland Security, just what goal is realistically served by deployment of BPL, regardless of the technical issues strenuously being argued between the interests involved? Overuse of the catchphrase Homeland Security without further explanation adds nothing to the analysis of what is really necessary. Is it more important that more people have more broadband internet access than maintaining a well prepared, well equipments, privately financed corp of trained radio operators whom have proved a passion for getting it right and doing whatever it takes when the public needs them? In a natural disaster or the occurrence of an unthinkable event related to terrorism, will the public be tuned to their internet service (BPL or otherwise) or to the ubiquitous AM/FM radio sets that everyone and their pets seem to have and carry everywhere?

Power line systems are normally the first element of the national infrastructures to fail from natural or man-made disasters, or indeed from negligence or inaction from purposeful cost cutting necessitated by the deregulation of the utilities. The BPL service will just not be available to the public when this happens. In an emergency or even just a tense or potential urgent situation, the public always turns first to the simplest, wireless means of mass information and communications, the radio. While

television broadcasts are also popular, the AM/FM broadcast radio, handheld, or the set in every automobile, seems to be the first choice of the information consuming public. If this is the case, almost no plausible argument can be advanced that somehow BPL adds to our security. However, any system that increases the noise floor for radio systems of any type pose a likely issue and concern. While BPL providers have avoided the AM and FM broadcast band (likely because they are aware of the expected problems), interference caused to moderate and weak broadcast signal levels surely decrease the value of the radio services to all members of the public, and surely to the rural areas which rely almost entirely on broadcast radio and sometime shortwave broadcasts to gather information in a difficult situation.

If BPL regulations do not specifically provide protection to the Mobile class of radio service, such as the Amateur service and other HF and VHF services (including the Citizen's Band Personal Radio Service), the users in these services will not continue to deploy new and improved equipment at their own expense as they do now. The most important constituents of the public service groups which populate the Amateur Service are the licensees which maintain and operate HF mobile stations. In time of need, this class of station is the most important asset coveted by the public agencies served by the Service.

The ability to deploy a well maintained, ready to go fleet of mobile self-contained HF stations which are not dependant on VHF or UHF repeater system infrastructure has shown to be of paramount importance in many natural disasters whether local or regional. Being able to communicate using skywave propagation when telephone,

power and local communications system are down is implicit in the Commissions stated goals. Accordingly, it is rational to encourage the maintenance of such assets. If the regulations as finally promulgated do not require that any interference to mobile operations must be corrected, the Commission would have weakened an important tool for this countries first responders and served agencies.

In light of the above, an unintended consequence of the demonstrated interference to mobile stations from BPL is that Amateurs will not continue to deploy and maintain well equipped mobile stations even if the interference to their operations is only moderate and experienced only when driving in the vicinity of low and medium voltage power lines carrying access BPL. The reason for this is that Amateurs invest both time and money in maintaining and perpetually improving their stations because they can actually use them on a regular basis when not using them to assist in a urgent communciations situation. A typical amateur HF operator does not limit his operation to times of need only, nor would such an operating practice be desirable to assure a "ready to go" and " tried and tested" status of a fleet of mobile stations at the ready.

It seems to this commenter that many, if not most amateurs will ***not*** continue to invest time and money in Mobile operations if the noise actually now being observed at BPL test sites occurs regularly along many low and medium voltage power lines carrying BPL. It is significant that many, if not most, of the targeted power lines for BPL run nearby or along the right of way of many major roads. Amateurs experiencing noise, even if not debilitating to the communications being attempted, will lose interest in fighting such spectrum pollution and revert to other activities in their daily commute

rather that hone their skills every day as they pursue their passion for HF mobile radio communications. Again, something is surely lost to the public if this happens.

This loss caused by interference (already observed) to mobile operations is particularly troublesome in light of the usefulness of mobile stations as stated above. The amateur community has experienced an dramatic increase in the quality of small, deployable mobile equipment for HF in the last several years. A quick review of the offerings of the larger reputable equipment suppliers identifies a never-before-available class of low power, rugged and self-contained class of equipment. Only recently has reliable, hand-held, self-contained, all band HF radio transceivers allowing voice, data and the emergency standby mode of Morse become available, allowing operation from any portable or mobile location. It is not surprising that the sales figures of such "back-packing" or "man-pack" military style radios reflect wide acceptance by Amateurs wishing to deploy mobile, ever-ready radio systems. While such classes of equipment is surely popular among radio Amateur because of their never quenched thirst to practice the art of HF communications and push the limits, the country has always reaped the benefits of this equivalent of a communications national guard.

Discouragement of such pursuits will surely result if the BPL proponents are permitted to, in any way, self define what is meant by the Commission in Part 15 when it refers to "harmful" interference, as differentiate with any received interference to licensed services. Thus, even if proponents of BPL argue that the interference caused by BPL will necessarily stop in an emergency or a disaster, this argument fails to recognize just how the amateur service operates.

Development of self contained HF mobile stations is particularly important in light of their capabilities with the type of equipment deployed by radio amateurs. For regional communications in time of emergency, the 3.5 MHz, 5 MHz and 7.0 MHz amateur allocations are particularly useful by allowing the amateur mobile station to pick the best band for the intended regional operation whether daytime or evening. 1.8 MHz is also used as a regional back up band which is now populated more and more by portable or mobile stations in view of the equipment now available. However, it has been observed that the 29 MHz and 50 MHz bands, for short range tactical communications within and among amateur stations participating in emergency or public agency support communications, provide a solution to supplement possible loss of VHF and UHF amateur systems in natural disasters and/or power loss after back-up battery supplies are exhausted at communications repeater sites.

Because of the increased availability and deployment of HF mobile stations as discussed above, and particularly in view of the Commission's recent interest to allowing HF access by many more radio amateurs (resulting from the proposals for restructuring of the rules effecting the amateur service), many amateur radio public service groups are revisiting the ability to use direct, (surface wave) communciations between mobile stations using single sideband modes operating at low power (5 watts) to up to a 100 watt power level. At ranges of 5 to 10 miles between mobile stations using 28 MHz or 50 MHz, weak but consistent signals (frequently unaffected by skywave propagation) can be employed as a reliable and useful alternative to more sophisticated systems using VHF and UHF bands which require repeating. Because

they avoid the need for any immediate repeating equipment, Amateurs are making good use of the referenced spectrum.

The problem with BPL deployment is that the present systems appear to favor this upper range of the HF spectrum. The signals levels used by amateurs for the described activity is not much more that the background noise level. The noise levels on 28 MHz and 50 MHz are naturally much lower than bands lower in frequency, which may be the reason that BPL is deployed more frequently in this upper HF range. Even weak levels of interference can and will prevent an amateur mobile station from hearing another weak mobile station with which it is attempting to communicate. Since BPL interference seems to be a problem for fixed stations out to beyond 1500 meters from any power line carrying BPL, the problem cannot be remedied by mobile stations erecting fixed antennas where deployed. Such a remedy would also limit the utility of a mobile station in any event.

It is therefore imperative that this Commission adopt strict rules which would require BPL providers to eliminate all interference from their operations, including interference to licensed mobile operations in the affected spectrum. Further, BPL should also be excluded from creating interference to other services, some of which are not licensed. The citizen's band radio service, for example, is used by millions of Americans for informal, usually always mobile communications while traveling or commuting. There are literally millions of operational citizen's band radio sets operating in the 27 MHz frequency range. Reasonable quality CB transceivers can be purchased by the public for as little as $20.00 or $30.00, and are used frequently in rural areas and

during traveling by the motoring public. Since this is a low power service (5 watts), and utilizes amplitude modulation (AM), this service would be one of the most susceptible to the present BPL systems which operate in that frequency range. In times of local emergency, power outage, local floods and other urgent situations the citizen's band still seems to be the basic public communications "grapevine," where neighbors communicate with neighbors and to vehicles in the affected area. While certainly not at the level of the amateur service, the citizen's band is still the nation's neighborhood intercom because it seems that almost everyone has a workable CB transceiver, even if sitting on the back shelf unconnected, or has one in a vehicle and can get on the air to talk "down the road" in a situation where the telephones and cell phones are out of service.

Further, the Federal Emergency Management Agency ("FEMA") has suggested that every American have a portable AM and FM radio which runs on batteries or is in the new class of "crank up" hand power generated receiver. These receivers are sensitive AM/FM radios which also all appear to have shortwave capability, presumably to assure reception of some form of broadcasts in rural areas, as well as possible announcements from government time signal stations and the like. Rural areas are often the ones that need mobile communications the most, and undisturbed radio reception in times of local, regional or national emergency. Requiring strict interference elimination requirements on the BPL provider is in the national interest in this regard.

III. The Imposition of Stricter Measurement Requirements and Interference

Elimination Should Be Part of a New Strategic Plan by the Commission to Reduce Radio Spectrum Noise Pollution in the Long Term.

The Commission is now at a turning point, wherein it has the opportunity to strike out in a new direction by deciding that the Commission's long term strategic plan would be to reduce radio spectrum noise pollution for everyone. Certainly government regulations preserving our natural resources and preventing pollution have benefitted almost every type of natural resource in this country. However, the radio spectrum has not been the subject of serious government review of the problems that are caused by the proliferation of small, low level polluters. Part 15 regulations were likely promulgated at a time when it was unforeseeable that so many pieces of equipment would take advantage of the loophole which allows for equipment to operate almost anywhere in the radio spectrum under the rules if it does not cause harmful interference and otherwise complies with the requirements. Today, everything used in one's home appears to radiate RF energy, whether intentional, unintentional or incidental.

Speaking from my own experience, there has been a crescendo of unwanted interference I have observed from my typical residential station location when measured from the first construct of my present location eighteen years ago, to the present date. Having had to track down the source of such interference, as well as assisting other amateurs to cure interference problems as part of my *pro bono* legal services to radio amateurs with such problems, it has been my observation part 15 devices cause as much interference as incidental radiators such as electric motors, compressors and noisy power lines caused by disabled power line components which generate broad

spectrum noise to amateurs and broadcast radio receivers. While power line noise is still always a problem, in the last five years many of the calls that I have received from amateurs requesting legal advice with an interference problem have resulted from noise which turns out to be part 15 devices, not necessarily power line components which have corroded or failed. Some of the biggest offenders appear to be those systems which utilize the AC power lines to communicate within a given residence, such as computer network devices, AC telephone extension devices and other devices which utilize the residential power wires as a communications medium for digital or analog information.

Such part 15 devices are ostensibly operating within the radiation limits of part 15 and would be though to cause interference only to the actual user within their own residence. It is my experience and the experience of amateurs who have consulted with me that many of these devices sometimes radiate for many of hundreds of feet beyond the residence employing the devices. Whether this is a result of coupling with the AC power lines, or the result of the actual consumer device performing outside the limits of the device certification cannot be known to us because we do not have sufficient laboratory equipment to make such tests. Certainly some manufactures of these devices may not have as effective a design as others, and not all such devices can be placed in the same category as blatant offenders. However, tighter radiation limits for all such devices is now appropriate given there unprecedented deployment.

The greater problem in attempting to solve such issues is that the consumer using the product, though frequently polite when contacted, usually wants nothing or

little to do with solving the problem. From a consumer's prospective, purchasing an expensive accessory or "gadget" for use with their entertainment system, wireless intercom, computer network or the like gives them carte blanche to do with it whatever they wish as long as it has no "visible" detrimental effects to anyone. Having someone politely inquire about why interference is emanating from the consumer's home usually does not result in satisfactory cooperation from the consumer. This is understandable given human nature. There truly is no realistic or satisfactory legal remedy to cure this situation short of new, tighter and more modern regulations.

While BPL proponents may point to the lack of interference complaints about part 15 devices which use AC power lines, this may be because such complaints would never reach the manufacturer for understandable reasons. Consumers purchasing the device, and whom would have privy with the manufacturer generally don't complain that a device is causing interference to someone else in the neighborhood. Amateurs or other users of the spectrum wishing to complain about interference are usually, for likewise understandable reasons, not given easy access to the device to gather enough information to contact the manufacturer. Even if one were to do that, which this writer has, those manufacturers generally are not cooperative if the inquirer is not the one who owns the product. Indeed, even in contacting a large manufacturer of 2.4 GHz digital spread spectrum telephones in my own residence to complain about the fact that the product produced significant interference over a considerably broader spectrum than the wireless phone frequencies, the manufacturer commented that since the design of the phone and the FCC certification of the design showed that it wouldn't

interfere, the interference I was observing was not possible and in any event the phone was out of warranty.

Thus, the problem with part 15 devices may be that although a given design is certified to comply with FCC requirements, many types of such products can become noncompliant when deployed in a consumer environment. In the alternative, compliant devices cause greater interference than contemplated as problematic when part 15 limits were written. Therefore, it would serve the public interest to impose stricter limits, measurement requirements and interference elimination rules, not only as a result of the present BPL inquiry, but also in adjustments to part 15 limits universally.

A greater good can emerge from the present BPL debate and inquiry if it brings to the Commission's attention the serious problem caused by the cacophony of electronically noisy and spectrum-polluting devices that may sometimes actually be operating within the part 15 limits, but causing a loss of spectrum usefulness for those users for whom any amount of low level interference may cause complete loss of reasonable use of that part of the spectrum for their purposes. Indeed, because of an AC power line home computer networking system operating a hundred feet or so from my residence, I am regularly prevented from participating in a weekly amateur radio emergency service net which meets on the high end of the 75 meter amateur band because of digital noise from that system, either communicated over the neighborhood power lines or radiated from the user's AC power wires in their residence which act as an antenna. Though the noise is greatest in the 4 MHz and 5 MHz range, it extends downward past 4 MHz to render the top part of the 75 meter amateur band unusable

while it is in operation. I should not have to buy the neighbor a 2.4 Ghz wireless hub to cure the problem but that is likely my only realistic remedy. From my experience, this type of interference is typical, and likely never finds its way back as a report to the manufacturer for the reasons set forth above. If it did, whether the few reports actually received would cause the manufacturer to investigate is doubtful.

IV. Strict Interference Mitigation Requirements, as Well as Imposing Strict Enforcement Penalties upon Violators Is in the National Interest, Enhancing National and Homeland Security by Encouraging the Deployment of More Suitable and Reliable Broadband Technologies Which Would Be Stifled by the Encouragement of less Effective Technologies Which Transfers the Cost of Use to Present Spectrum Users.

If in fact BPL does not cause interference, as argued by BPL proponents, requiring automatic system shutdown, automatic interference mitigation means and other strict liability requirements on BPL providers should be little burden to them. It is in the public interest that there be no interference at any level from BPL systems. In view of the claims of no interference by BPL providers, it is a small cost on such providers to be required to act quicky to shut down interfering systems until remedies can be found. Moreover, because it is difficult for amateurs and other spectrum users to determine whether interference is occurring because of a new BPL system, a consumer part 15 device as discussed above, or from other types of interference sources, it is necessary that there be a complete, up-to-date and easily accessible

database of all BPL installations. Such databases must have information available to the public regarding frequencies used, locations of the actual lines carrying signals, and general locations of intended deployments. This will also benefit the BPL provider, since there would be very little room for mistake when spectrum users complain they are receiving AC power line interference which appear to carry digital signals which may not be BPL. As discussed above, some of such interference is generated by local part 15 devices using the power lines for communicating digital information. If this information is available to the affected spectrum user attempting to solve a noise problem, both the spectrum user and the BPL system operator will be spared time and expense by the elimination of BPL as the possible suspect. On the other hand, BPL providers may argue against such reporting because it would speed up the process of identifying BPL interference to a user, thereby requiring the BPL system to shut down before it would prefer to, to effect repairs or mitigate the interference in some other fashion.

BPL providers should be required to have systems which automatically mitigate interference, but such systems are likely only to prevent interference to the BPL provider and not to the spectrum user. Most of such systems designed published in the patent literature or in other technical journals appear to be systems which recognize interference to the BPL system itself, presumably from a local nearby transmitter, and eliminate use of that frequency until the local source stops transmitting. Clearly this would be an unacceptable solution in itself because it could not detect or remedy a spectrum user's desired use of a portion of the spectrum. Most of the time radio

operators, conforming with good operating practice, are listening and not transmitting. Moreover, this requirement alone would not take into account the fact that most spectrum users, and particularly radio amateurs, monitor a number of bands simultaneously.

At my fixed station location in the Philadelphia suburbs, I frequently have a number of different high performance radio receivers monitoring specific frequencies twenty-four hours a day, usually but not always listening within the amateur bands[5], many times specifically with a public service purpose. Experiencing BPL interference to my station on a variety of different portions of the radio spectrum will reduce the utility of my station almost entirely. It is difficult to conceive of what rules might be effective to gain relief from an interfering BPL provider if the request is to prevent interference on three or four different HF frequency bands for most of the day and evening. It seems to this writer to be unworkable, so to be effective there must be a requirement that BPL systems do not cause any interference if they are to operate at all.

In the case of my fixed station location, although power line feeds from the street to each residence are underground, low voltage and medium voltage feed lines also run above ground along all of the roads in the area. In my case, and in the case of almost all radio amateurs to which I have provided legal advice regarding interference or have who I have spoken to, it is not possible to orient one's antennas to minimize a coupling of part 15 level signals from the power distribution lines feeding the neighborhood. In a typical residential environment such as my fixed location, my residential structure is only

[5] *This commenter is also an FAA licensed pilot and CAP member monitoring aircraft and other government frequencies.*

15 meters from the power lines running down the street distributing power. Further, running at right angles to the power line in front of my station location are other power distribution wires of medium voltage feeding the remainder of the neighborhood. Those wires are less than 100 meters away and, running down a main road would likely be a candidate for BPL providers to use to feed such signals to a variety of different neighborhoods along the highway.

New rules or adjustments of the present rules must fortify the definition of "harmful" interference in view of the fact that this ambiguity has been used by other spectrum noise generators suggests that they are complying with the rules. In solving power line generated interference in the past, the power line interference problems have gone unsolved because in some instances it was claimed that the interference, while measurable and annoying, was not "harmful" because it did not prevent communications on the frequencies involved. If there is a lack of strict interference mitigation requirements, it will be almost impossible for the spectrum user to gain relief when the BPL provider claims that interference has been reduced to a level in which it is not harmful. If such an "unharmful" interference level is such that it prevents the spectrum user from receiving weak stations and raises the noise floor on any band, the Commission's intent in protecting licensed services and other users of the spectrum will be dissipated.

Since BPL providers will be permitted to shift their costs onto the public as discussed above, they will be able to deploy BPL systems at a lower cost than more suitable and reliable broadband technologies will be capable of doing. This

Commission is likely aware of the tremendous advantages that fiber optic cable systems will present to both urban and rural communities. Fiber optic cables have an overwhelming amount of bandwidth compared to BPL systems, provide absolutely not RF pollution or noise interference problems, and could benefit rural areas with two-way video, including video phone conferencing and the like, as well as the deployment of a plethora of otherwise unavailable services to such areas which would not be possible using the limitations of BPL technology.

The Commission has stated that it prefers that the marketplace sort out the contenders for the delivery of broadband services to the public. By having in place stricter interference limitation for BPL, this Commission will assure that it is providing a level playing field for all of the technologies which should be rolled out for the public benefit.

A useful analogy might be found with the present energy concerns our country faces. While few would doubt that we have a national interest in increasing the fuel mileage of our nation's automobiles, most members of the public would not wish to increase air pollution to gain higher fuel efficiency. Surely the manufactures could increase both power and fuel economy substantially for a given unit of fuel use if emissions standards were relaxed within one model year of time. Yet the intangible price paid in the future for this would exceed the savings in fuel we would surely realize. Thus, while an important national goal is served, such a relaxation of emission rules would not serve the public in the long run due to the other costs imposed.

Armed with the facts, I argue that the public would much rather have more

useful, “clean” fiber optic infrastructure for the new generation of internet services than a noisy, unreliable BPL system which is cheaper only because it foists its costs onto the public in certain less visible ways. To be sure, fiber optic and other wireless forms of communications are not as susceptible to failure through lightning, EMP, and external RF interference the way BPL surely will be. The Commission’s pending rule making procedure is posed to determine just how much of a chance more suitable, but perhaps higher cost systems will have in becoming a needed reality in rolling out our next generation of internet infrastructure. Taking the longer view by carefully considering and not underestimating the long term problems inherent in BPL and acting accordingly will assure the public is well served by this Commission.

Respectfully submitted,

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